

ABSTRACT

A method of operating and process for fabricating an electron source. A conductive rod is covered by an insulating layer, by dipping the rod in an insulation solution, for example. The rod is then covered by a field emitter material to form a layered conductive rod. The rod may also be covered by a second insulating material. Next, the materials are removed from the end of the rod and the insulating layers are recessed with respect to the field emitter layer so that a gap is present between the field emitter layer and the rod. The layered rod may be operated as an electron source within a vacuum tube by applying a positive bias to the rod with respect to the field emitter material and applying a higher positive bias to an anode opposite the rod in the tube. Electrons will accelerate to the charged anode and generate soft X-rays.